

SEQUENCE LISTING

<110> University of Pennsylvania
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<120> Fragments and Activity of Rel protein in M. Tuberculosis and other
uses thereof

<130> UPFT0002-500

<150> US 60/420,129

<151> 2002-10-22

<160> 20

<170> PatentIn version 3.2

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<211> 21

<212> DNA

<213> Mycobacterium tuberculosis

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21

<210> 2

<211> 34

<212> DNA

<213> Mycobacterium tuberculosis

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34

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<213> Mycobacterium tuberculosis

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35

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<212> DNA

<213> Mycobacterium tuberculosis

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<211> 36

<212> DNA

<213> Mycobacterium tuberculosis

<400> 5

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<213> Mycobacterium tuberculosis

<400> 6
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36

<210> 7
<211> 738
<212> PRT
<213> Mycobacterium tuberculosis

<400> 7

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Ala Val His Arg Glu Ile Tyr Pro Lys Ala Asp Leu Ser Ile Leu Gln
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Arg Ala Tyr Glu Val Ala Asp Gln Arg His Ala Ser Gln Leu Arg Gln
35 40 45

Ser Gly Asp Pro Tyr Ile Thr His Pro Leu Ala Val Ala Asn Ile Leu
50 55 60

Ala Glu Leu Gly Met Asp Thr Thr Thr Leu Val Ala Ala Leu Leu His
65 70 75 80

Asp Thr Val Glu Asp Thr Gly Tyr Thr Leu Glu Ala Leu Thr Glu Glu
85 90 95

Phe Gly Glu Glu Val Gly His Leu Val Asp Gly Val Thr Lys Leu Asp
100 105 110

Arg Val Val Leu Gly Ser Ala Ala Glu Gly Glu Thr Ile Arg Lys Met
115 120 125

Ile Thr Ala Met Ala Arg Asp Pro Arg Val Leu Val Ile Lys Val Ala
130 135 140

Asp Arg Leu His Asn Met Arg Thr Met Arg Phe Leu Pro Pro Glu Lys
145 150 155 160

Gln Ala Arg Lys Ala Arg Glu Thr Leu Glu Val Ile Ala Pro Leu Ala
165 170 175

His Arg Leu Gly Met Ala Ser Val Lys Trp Glu Leu Glu Asp Leu Ser
180 185 190

Phe Ala Ile Leu His Pro Lys Lys Tyr Glu Glu Ile Val Arg Leu Val
195 200 205

Ala Gly Arg Ala Pro Ser Arg Asp Thr Tyr Leu Ala Lys Val Arg Ala
210 215 220

Glu Ile Val Asn Thr Leu Thr Ala Ser Lys Ile Lys Ala Thr Val Glu
225 230 235 240

Gly Arg Pro Lys His Tyr Trp Ser Ile Tyr Gln Lys Met Ile Val Lys
245 250 255

Gly Arg Asp Phe Asp Asp Ile His Asp Leu Val Gly Val Arg Ile Leu
260 265 270

Cys Asp Glu Ile Arg Asp Cys Tyr Ala Ala Val Gly Val Val His Ser
275 280 285

Leu Trp Gln Pro Met Ala Gly Arg Phe Lys Asp Tyr Ile Ala Gln Pro
290 295 300

Arg Tyr Gly Val Tyr Gln Ser Leu His Thr Thr Val Val Gly Pro Glu
305 310 315 320

Gly Lys Pro Leu Glu Val Gln Ile Arg Thr Arg Asp Met His Arg Thr
325 330 335

Ala Glu Tyr Gly Ile Ala Ala His Trp Arg Tyr Lys Glu Ala Lys Gly
340 345 350

Arg Asn Gly Val Leu His Pro His Ala Ala Ala Glu Ile Asp Asp Met
355 360 365

Ala Trp Met Arg Gln Leu Leu Asp Trp Gln Arg Glu Ala Ala Asp Pro
370 375 380

Gly Glu Phe Leu Glu Ser Leu Arg Tyr Asp Leu Ala Val Gln Glu Ile
385 390 395 400

Phe Val Phe Thr Pro Lys Gly Asp Val Ile Thr Leu Pro Thr Gly Ser
405 410 415

Thr Pro Val Asp Phe Ala Tyr Ala Val His Thr Glu Val Gly His Arg
420 425 430

Cys Ile Gly Ala Arg Val Asn Gly Arg Leu Val Ala Leu Glu Arg Lys
435 440 445

Leu Glu Asn Gly Glu Val Val Glu Val Phe Thr Ser Lys Ala Pro Asn
450 455 460

Ala Gly Pro Ser Arg Asp Trp Gln Gln Phe Val Val Ser Pro Arg Ala
465 470 475 480

Lys Thr Lys Ile Arg Gln Trp Phe Ala Lys Glu Arg Arg Glu Glu Ala
485 490 495

Leu Glu Thr Gly Lys Asp Ala Met Ala Arg Glu Val Arg Arg Gly Gly
500 505 510

Leu Pro Leu Gln Arg Leu Val Asn Gly Glu Ser Met Ala Ala Val Ala
515 520 525

Arg Glu Leu His Tyr Ala Asp Val Ser Ala Leu Tyr Thr Ala Ile Gly
530 535 540

Glu Gly His Val Ser Ala Lys His Val Val Gln Arg Leu Leu Ala Glu
545 550 555 560

Leu Gly Gly Ile Asp Gln Ala Glu Glu Glu Leu Ala Glu Arg Ser Thr
565 570 575

Pro Ala Thr Met Pro Arg Arg Pro Arg Ser Thr Asp Asp Val Gly Val
580 585 590

Ser Val Pro Gly Ala Pro Gly Val Leu Thr Lys Leu Ala Lys Cys Cys
595 600 605

Thr Pro Val Pro Gly Asp Val Ile Met Gly Phe Val Thr Arg Gly Gly
610 615 620

Gly Val Ser Val His Arg Thr Asp Cys Thr Asn Ala Ala Ser Leu Gln
625 630 635 640

Gln Gln Ala Glu Arg Ile Ile Glu Val Leu Trp Ala Pro Ser Pro Ser
645 650 655

Ser Val Phe Leu Val Ala Ile Gln Val Glu Ala Leu Asp Arg His Arg
660 665 670

Leu Leu Ser Asp Val Thr Arg Ala Leu Ala Asp Glu Lys Val Asn Ile
675 680 685

Leu Ser Ala Ser Val Thr Thr Ser Gly Asp Arg Val Ala Ile Ser Arg
690 695 700

Phe Thr Phe Glu Met Gly Asp Pro Lys His Leu Gly His Leu Leu Asn
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Ala Val Arg Asn Val Glu Gly Val Tyr Asp Val Tyr Arg Val Thr Ser
725 730 735

Ala Ala

<210> 8
<211> 450
<212> PRT
<213> Mycobacterium tuberculosis

<400> 8

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1 5 10 15

Ala Val His Arg Glu Ile Tyr Pro Lys Ala Asp Leu Ser Ile Leu Gln
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Arg Ala Tyr Glu Val Ala Asp Gln Arg His Ala Ser Gln Leu Arg Gln
35 40 45

Ser Gly Asp Pro Tyr Ile Thr His Pro Leu Ala Val Ala Asn Ile Leu
50 55 60

Ala Glu Leu Gly Met Asp Thr Thr Thr Leu Val Ala Ala Leu Leu His
65 70 75 80

Asp Thr Val Glu Asp Thr Gly Tyr Thr Leu Glu Ala Leu Thr Glu Glu
85 90 95

Phe Gly Glu Glu Val Gly His Leu Val Asp Gly Val Thr Lys Leu Asp
100 105 110

Arg Val Val Leu Gly Ser Ala Ala Glu Gly Glu Thr Ile Arg Lys Met
115 120 125

Ile Thr Ala Met Ala Arg Asp Pro Arg Val Leu Val Ile Lys Val Ala
130 135 140

Asp Arg Leu His Asn Met Arg Thr Met Arg Phe Leu Pro Pro Glu Lys
145 150 155 160

Gln Ala Arg Lys Ala Arg Glu Thr Leu Glu Val Ile Ala Pro Leu Ala
165 170 175

His Arg Leu Gly Met Ala Ser Val Lys Trp Glu Leu Glu Asp Leu Ser

180

185

190

Phe Ala Ile Leu His Pro Lys Lys Tyr Glu Glu Ile Val Arg Leu Val
195 200 205

Ala Gly Arg Ala Pro Ser Arg Asp Thr Tyr Leu Ala Lys Val Arg Ala
210 215 220

Glu Ile Val Asn Thr Leu Thr Ala Ser Lys Ile Lys Ala Thr Val Glu
225 230 235 240

Gly Arg Pro Lys His Tyr Trp Ser Ile Tyr Gln Lys Met Ile Val Lys
245 250 255

Gly Arg Asp Phe Asp Asp Ile His Asp Leu Val Gly Val Arg Ile Leu
260 265 270

Cys Asp Glu Ile Arg Asp Cys Tyr Ala Ala Val Gly Val Val His Ser
275 280 285

Leu Trp Gln Pro Met Ala Gly Arg Phe Lys Asp Tyr Ile Ala Gln Pro
290 295 300

Arg Tyr Gly Val Tyr Gln Ser Leu His Thr Thr Val Val Gly Pro Glu
305 310 315 320

Gly Lys Pro Leu Glu Val Gln Ile Arg Thr Arg Asp Met His Arg Thr
325 330 335

Ala Glu Tyr Gly Ile Ala Ala His Trp Arg Tyr Lys Glu Ala Lys Gly
340 345 350

Arg Asn Gly Val Leu His Pro His Ala Ala Ala Glu Ile Asp Asp Met
355 360 365

Ala Trp Met Arg Gln Leu Leu Asp Trp Gln Arg Glu Ala Ala Asp Pro
370 375 380

Gly Glu Phe Leu Glu Ser Leu Arg Tyr Asp Leu Ala Val Gln Glu Ile
385 390 395 400

Phe Val Phe Thr Pro Lys Gly Asp Val Ile Thr Leu Pro Thr Gly Ser
405 410 415

Thr Pro Val Asp Phe Ala Tyr Ala Val His Thr Glu Val Gly His Arg
420 425 430

Cys Ile Gly Ala Arg Val Asn Gly Arg Leu Val Ala Leu Glu Arg Lys

435

440

445

Leu Glu
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<210> 9
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<212> PRT
<213> Mycobacterium tuberculosis

<400> 9

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Ala Val His Arg Glu Ile Tyr Pro Lys Ala Asp Leu Ser Ile Leu Gln
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Arg Ala Tyr Glu Val Ala Asp Gln Arg His Ala Ser Gln Leu Arg Gln
35 40 45

Ser Gly Asp Pro Tyr Ile Thr His Pro Leu Ala Val Ala Asn Ile Leu
50 55 60

Ala Glu Leu Gly Met Asp Thr Thr Thr Leu Val Ala Ala Leu Leu His
65 70 75 80

Asp Thr Val Glu Asp Thr Gly Tyr Thr Leu Glu Ala Leu Thr Glu Glu
85 90 95

Phe Gly Glu Glu Val Gly His Leu Val Asp Gly Val Thr Lys Leu Asp
100 105 110

Arg Val Val Leu Gly Ser Ala Ala Glu Gly Glu Thr Ile Arg Lys Met
115 120 125

Ile Thr Ala Met Ala Arg Asp Pro Arg Val Leu Val Ile Lys Val Ala
130 135 140

Asp Arg Leu His Asn Met Arg Thr Met Arg Phe Leu Pro Pro Glu Lys
145 150 155 160

Gln Ala Arg Lys Ala Arg Glu Thr Leu Glu Val Ile Ala Pro Leu Ala
165 170 175

His Arg Leu Gly Met Ala Ser Val Lys Trp Glu Leu Glu Asp Leu Ser
180 185 190

Phe Ala Ile Leu His Pro Lys Lys Tyr Glu Glu Ile Val Arg Leu Val
195 200 205

Ala Gly Arg Ala Pro Ser Arg Asp Thr Tyr Leu Ala Lys Val Arg Ala
210 215 220

Glu Ile Val Asn Thr Leu Thr Ala Ser Lys Ile Lys Ala Thr Val Glu
225 230 235 240

Gly Arg Pro Lys His Tyr Trp Ser Ile Tyr Gln Lys Met Ile Val Lys
245 250 255

Gly Arg Asp Phe Asp Asp Ile His Asp Leu Val Gly Val Arg Ile Leu
260 265 270

Cys Asp Glu Ile Arg Asp Cys Tyr Ala Ala Val Gly Val Val His Ser
275 280 285

Leu Trp Gln Pro Met Ala Gly Arg Phe Lys Asp Tyr Ile Ala Gln Pro
290 295 300

Arg Tyr Gly Val Tyr Gln Ser Leu His Thr Thr Val Val Gly Pro Glu
305 310 315 320

Gly Lys Pro Leu Glu Val Gln Ile Arg Thr Arg Asp Met His Arg Thr
325 330 335

Ala Glu Tyr Gly Ile Ala Ala His Trp Arg Tyr Lys Glu Ala Lys Gly
340 345 350

Arg Asn Gly Val Leu His Pro His Ala Ala Ala Glu Ile Asp Asp Met
355 360 365

Ala Trp Met Arg Gln Leu Leu Asp Trp Gln Arg Glu Ala Ala Asp Pro
370 375 380

Gly Glu Phe Leu Glu Ser Leu Arg Tyr Asp
385 390

<210> 10

<211> 203

<212> PRI

<213> Mycobacterium tuberculosis

<400> 10

Met Thr Ala Gln Arg Ser Thr Thr Asn Pro Val Leu Glu Pro Leu Val
1 5 10 15

Ala Val His Arg Glu Ile Tyr Pro Lys Ala Asp Leu Ser Ile Leu Gln
20 25 30

Arg Ala Tyr Glu Val Ala Asp Gln Arg His Ala Ser Gln Leu Arg Gln
35 40 45

Ser Gly Asp Pro Tyr Ile Thr His Pro Leu Ala Val Ala Asn Ile Leu
50 55 60

Ala Glu Leu Gly Met Asp Thr Thr Thr Leu Val Ala Ala Leu Leu His
65 70 75 80

Asp Thr Val Glu Asp Thr Gly Tyr Thr Leu Glu Ala Leu Thr Glu Glu
85 90 95

Phe Gly Glu Glu Val Gly His Leu Val Asp Gly Val Thr Lys Leu Asp
100 105 110

Arg Val Val Leu Gly Ser Ala Ala Glu Gly Glu Thr Ile Arg Lys Met
115 120 125

Ile Thr Ala Met Ala Arg Asp Pro Arg Val Leu Val Ile Lys Val Ala
130 135 140

Asp Arg Leu His Asn Met Arg Thr Met Arg Phe Leu Pro Pro Glu Lys
145 150 155 160

Gln Ala Arg Lys Ala Arg Glu Thr Leu Glu Val Ile Ala Pro Leu Ala
165 170 175

His Arg Leu Gly Met Ala Ser Val Lys Trp Glu Leu Glu Asp Leu Ser
180 185 190

Phe Ala Ile Leu His Pro Lys Lys Tyr Glu Glu
195 200

<210> 11
<211> 181
<212> PRT
<213> Mycobacterium tuberculosis

<400> 11

Met Thr Ala Gln Arg Ser Thr Thr Asn Pro Val Leu Glu Pro Leu Val
1 5 10 15

Ala Val His Arg Glu Ile Tyr Pro Lys Ala Asp Leu Ser Ile Leu Gln
20 25 30

Arg Ala Tyr Glu Val Ala Asp Gln Arg His Ala Ser Gln Leu Arg Gln
35 40 45

Ser Gly Asp Pro Tyr Ile Thr His Pro Leu Ala Val Ala Asn Ile Leu
50 55 60

Ala Glu Leu Gly Met Asp Thr Thr Thr Leu Val Ala Ala Leu Leu His
65 70 75 80

Asp Thr Val Glu Asp Thr Gly Tyr Thr Leu Glu Ala Leu Thr Glu Glu
85 90 95

Phe Gly Glu Glu Val Gly His Leu Val Asp Gly Val Thr Lys Leu Asp
100 105 110

Arg Val Val Leu Gly Ser Ala Ala Glu Gly Glu Thr Ile Arg Lys Met
115 120 125

Ile Thr Ala Met Ala Arg Asp Pro Arg Val Leu Val Ile Lys Val Ala
130 135 140

Asp Arg Leu His Asn Met Arg Thr Met Arg Phe Leu Pro Pro Glu Lys
145 150 155 160

Gln Ala Arg Lys Ala Arg Glu Thr Leu Glu Val Ile Ala Pro Leu Ala
165 170 175

His Arg Leu Gly Met
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<210> 12

<211> 156

<212> PRT

<213> Mycobacterium tuberculosis

<400> 12

Met Thr Ala Gln Arg Ser Thr Thr Asn Pro Val Leu Glu Pro Leu Val
1 5 10 15

Ala Val His Arg Glu Ile Tyr Pro Lys Ala Asp Leu Ser Ile Leu Gln
20 25 30

Arg Ala Tyr Glu Val Ala Asp Gln Arg His Ala Ser Gln Leu Arg Gln
35 40 45

Ser Gly Asp Pro Tyr Ile Thr His Pro Leu Ala Val Ala Asn Ile Leu
50 55 60

Ala Glu Leu Gly Met Asp Thr Thr Thr Leu Val Ala Ala Leu Leu His
65 70 75 80

Asp Thr Val Glu Asp Thr Gly Tyr Thr Leu Glu Ala Leu Thr Glu Glu

85

90

95

Phe Gly Glu Glu Val Gly His Leu Val Asp Gly Val Thr Lys Leu Asp
100 105 110

Arg Val Val Leu Gly Ser Ala Ala Glu Gly Glu Thr Ile Arg Lys Met
115 120 125

Ile Thr Ala Met Ala Arg Asp Pro Arg Val Leu Val Ile Lys Val Ala
130 135 140

Asp Arg Leu His Asn Met Arg Thr Met Arg Phe Leu
145 150 155

<210> 13
<211> 308
<212> PRT
<213> Mycobacterium tuberculosis

<400> 13

Gly Tyr Thr Leu Glu Ala Leu Thr Glu Glu Phe Gly Glu Glu Val Gly
1 5 10 15

His Leu Val Asp Gly Val Thr Lys Leu Asp Arg Val Val Leu Gly Ser
20 25 30

Ala Ala Glu Gly Glu Thr Ile Arg Lys Met Ile Thr Ala Met Ala Arg
35 40 45

Asp Pro Arg Val Leu Val Ile Lys Val Ala Asp Arg Leu His Asn Met
50 55 60

Arg Thr Met Arg Phe Leu Pro Pro Glu Lys Gln Ala Arg Lys Ala Arg
65 70 75 80

Glu Thr Leu Glu Val Ile Ala Pro Leu Ala His Arg Leu Gly Met Ala
85 90 95

Ser Val Lys Trp Glu Leu Glu Asp Leu Ser Phe Ala Ile Leu His Pro
100 105 110

Lys Lys Tyr Glu Glu Ile Val Arg Leu Val Ala Gly Arg Ala Pro Ser
115 120 125

Arg Asp Thr Tyr Leu Ala Lys Val Arg Ala Glu Ile Val Asn Thr Leu
130 135 140

Thr Ala Ser Lys Ile Lys Ala Thr Val Glu Gly Arg Pro Lys His Tyr
145 150 155 160

Trp Ser Ile Tyr Gln Lys Met Ile Val Lys Gly Arg Asp Phe Asp Asp
165 170 175

Ile His Asp Leu Val Gly Val Arg Ile Leu Cys Asp Glu Ile Arg Asp
180 185 190

Cys Tyr Ala Ala Val Gly Val Val His Ser Leu Trp Gln Pro Met Ala
195 200 205

Gly Arg Phe Lys Asp Tyr Ile Ala Gln Pro Arg Tyr Gly Val Tyr Gln
210 215 220

Ser Leu His Thr Thr Val Val Gly Pro Glu Gly Lys Pro Leu Glu Val
225 230 235 240

Gln Ile Arg Thr Arg Asp Met His Arg Thr Ala Glu Tyr Gly Ile Ala
245 250 255

Ala His Trp Arg Tyr Lys Glu Ala Lys Gly Arg Asn Gly Val Leu His
260 265 270

Pro His Ala Ala Ala Glu Ile Asp Asp Met Ala Trp Met Arg Gln Leu
275 280 285

Leu Asp Trp Gln Arg Glu Ala Ala Asp Pro Gly Glu Phe Leu Glu Ser
290 295 300

Leu Arg Tyr Asp
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<210> 14
<211> 1350
<212> DNA
<213> Mycobacterium tuberculosis

<400> 14
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gccaacattc tggccgagtt gggcatggac accaccactt tggtggccgc gctgctgcac 240
gacaccgtcg aggacaccgg ttacaccctg gaggcggtga ccgaggaatt cggcgaagag 300
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gaaggcgaga ctattcgcaa gatgatcacc gcgatggccc gcgatccgcg ggtgctggtg 420
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caggcccgca aggcccggtga gacgttggaa gtcattgcac ccctggcgca tcggctgggc 540
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tacgaggaga tcgtccggct ggtcgccggt cgcgcgccgt cccgggacac ctacctggcc 660
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cggttggtag cgctggaacg caagctggaa 1350

<210> 15

<211> 1182

<212> DNA

<213> Mycobacterium tuberculosis

<400> 15

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aggcatgcca gccagttgcg gcagtcgggt gatccctaca tcaccacccc gttggccggt 180
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<210> 16
<211> 609
<212> DNA
<213> Mycobacterium tuberculosis

<400> 16
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aggcatgcca gccagttgcg gcagtcgggt gatccctaca tcaccacccc gttggccggt 180
gccaacattc tggccgagtt gggcatggac accaccactt tgggtggccgc gctgctgcac 240
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tacgaggag 609

<210> 17
<211> 543
<212> DNA
<213> Mycobacterium tuberculosis

<400> 17
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gaaggcgaga ctattcgcaa gatgatcacc gcgatggccc gcgatccgcg ggtgctggtg 420
ataaagggtg ctgaccggtt acacaacatg cgcaccatgc gcttcttgcc gccggagaag 480

caggcccgca aggcccggtga gacgttggaa gtcattgcac ccctggcgca tcggctgggc 540
atg 543

<210> 18
<211> 468
<212> DNA
<213> Mycobacterium tuberculosis

<400> 18
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gccaacattc tggccgagtt gggcatggac accaccactt tgggtggccgc gctgctgcac 240
gacaccgtcg aggacaccgg ttacaccctg gaggcggtga ccgaggaatt cggcgaagag 300
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gaaggcgaga ctattcgcaa gatgatcacc gcgatggccc gcgatccgcg ggtgctggtg 420
ataaaggtgg ctgaccgggtt acacaacatg cgcaccatgc gcttcttg 468

<210> 19
<211> 924
<212> DNA
<213> Mycobacterium tuberculosis

<400> 19
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aagatgatca ccgcgatggc ccgcgatccg cgggtgctgg tgataaaggt ggctgaccgg 180
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gagacgttgg aagtcattgc acccctggcg catcggctgg gcatggccag cgtcaagtgg 300
gagttggagg acctgtcctt cgcgatcctg catcccaaga agtacgagga gatcgtccgg 360
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gtcaacacgc tgaccgcgtc gaagatcaag gcgacggtgg agggccgccc caagcactat 480
tggtcgatct accagaagat gatcgttaag ggccgcgact tcgacgacat ccacgacctg 540
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cagatccgta cccgcgacat gcaccgcacc gccgaatacg gcatcgccgc gcattggcgc 780
tacaaagaag ccaagggccg caacggtgtt cttcatccgc atgccgccgc ggagatcgac 840
gacatggcct ggatgcgtca gctgctcgac tggcaacgtg aggcggccga ccccggtgag 900

ttcttggaat cattgcgcta cgac

924

<210> 20

<211> 2373

<212> DNA

<213> Mycobacterium tuberculosis

<400> 20

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